0057046

SAF-B04-002
100 BC Burial Grounds – Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) MJP 9-27-05
INITIAL/DATE

SDG H3321 SAF-B04-002

Sample Location/Waste Site: 600-233

Date: 9 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Grounds – Soil Full Protocol – Waste Site 600-233
Subject: Semivolatile - Data Package No. H3321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3321-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Matrix	Validation	Detail
J03WJ1	8/9/05	Soil	C	See note 1
J03WJ2	8/9/05	Soil	C	See note 1
J03WJ3	8/9/05	Soil	C	See note 1
J03WJ4	8/9/05	Soil	C	See note 1

1 – Semivolatiles by 8270C.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two

times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples were qualified as undetected, raised to the RDL and flagged "U".

Due to method blank contamination, the di-n-butylphthalate and benzo(g,h,i)perylene results in sample J03WJ2 were raised to the RQL, qualified as undetected and flagged "U".

Due to method blank contamination, the di-n-butylphthalate, benzo(b)fluoranthene, ideno(1,2,3-cd)pyrene and benzo(g,h,i)perylene results in sample J03WJ3 were raised to the RQL, qualified as undetected and flagged "U".

Due to method blank contamination, the benzo(k)fluoranthene results in samples J03WJ1 and J03WJ3 were raised to the RQL, qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

One field blank (J03WJ4) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries below control limits are qualified as estimates and flagged "UJ". Undetected sample results are not qualified if the spike recovery is above control limits. Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes.

Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. Thirty-two analytes exceeded the RQL. Under the BHI statement of work, no qualification is required. All other analytes met the RQL.

- **Completeness**

Data package No. H3321-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following minor deficiencies were noted:

- Due to method blank contamination, the bis(2-ethylhexyl)phthalate result in all samples were qualified as undetected, raised to the RDL and flagged "U".

- Due to method blank contamination, the di-n-butylphthalate and benzo(g,h,i)perylene results in sample J03WJ2 were raised to the RQL, qualified as undetected and flagged "U".

- Due to method blank contamination, the di-n-butylphthalate, benzo(b)fluoranthene, ideno(1,2,3-cd)pyrene and benzo(g,h,i)perylene results in sample J03WJ3 were raised to the RQL, qualified as undetected and flagged "U".

- Due to method blank contamination, the benzo(k)fluoranthene results in samples J03WJ1 and J03WJ3 were raised to the RQL, qualified as undetected and flagged "U".

Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Thirty-two analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the same quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

SEMIVOLATILE DATA QUALIFICATION SUMMARY*

SDG: H3321	REVIEWER: TLL	Project: 600-233	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate Benzo(g,h,i)perylene	U at RQL	J03WJ2	Method blank contamination
Di-n-butylphthalate Benzo(b)fluoranthene Ideno(1,2,3-cd)pyrene Benzo(g,h,i)perylene	U at RQL	J03WJ3	Method blank contamination
Bis(2-ethylhexyl)phthalate	U at RQL	All	Method blank contamination
Benzo(k)fluoranthene	U at RQL	J03WJ1, J03WJ3	Method blank contamination

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG) Page__1__ of__2__

Project: BECHTEL-HANFORD									
Laboratory: LLI	SDG: H3321								
Sample Number		J03WJ1		J03WJ2		J03WJ3		J03WJ4	
Remarks								E. Blank	
Sample Date		8/9/05		8/9/05		8/9/05		8/9/05	
Extraction Date		8/15/05		8/15/05		8/15/05		8/15/05	
Analysis Date		8/16/05		8/16/05		8/16/05		8/16/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	330	U	330	U	330	U	330	U
bis(2-Chloroethyl)ether	660	330	U	330	U	330	U	330	U
2-Chlorophenol	660	330	U	330	U	330	U	330	U
1,3-Dichlorobenzene	660	330	U	330	U	330	U	330	U
1,4-Dichlorobenzene	660	330	U	330	U	330	U	330	U
1,2-Dichlorobenzene	660	330	U	330	U	330	U	330	U
2-Methylphenol	660	330	U	330	U	330	U	330	U
2,2'-oxybis(1-chloropropane)	660	330	U	330	U	330	U	330	U
3 and/or 4-Methylphenol	660	330	U	330	U	330	U	330	U
N-Nitroso-di-n-propylamine	660	330	U	330	U	330	U	330	U
Hexachloroethane	660	330	U	330	U	330	U	330	U
Nitrobenzene	660	330	U	330	U	330	U	330	U
Isophorone	660	330	U	330	U	330	U	330	U
2-Nitrophenol	660	330	U	330	U	330	U	330	U
2,4-Dimethylphenol	660	330	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane	660	330	U	330	U	330	U	330	U
2,4-Dichlorophenol	660	330	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene	660	330	U	330	U	330	U	330	U
Naphthalene	660	330	U	330	U	330	U	330	U
4-Chloroaniline	660	330	U	330	U	330	U	330	U
Hexachlorobutadiene	660	330	U	330	U	330	U	330	U
4-Chloro-3-methylphenol	660	330	U	330	U	330	U	330	U
2-Methylnaphthalene	660	330	U	330	U	330	U	330	U
Hexachlorocyclopentadiene	660	330	U	330	U	330	U	330	U
2,4,6-Trichlorophenol	660	330	U	330	U	330	U	330	U
2,4,5-Trichlorophenol*	660	830	U	830	U	830	U	830	U
2-Chloronaphthalene	660	330	U	330	U	330	U	330	U
2-Nitroaniline*	660	830	U	830	U	830	U	830	U
Dimethylphthalate	660	330	U	330	U	330	U	330	U
Acenaphthylene	660	330	U	330	U	330	U	330	U
2,6-Dinitrotoluene	660	330	U	330	U	330	U	330	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

SEMIVOLATILE ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD									
Laboratory: LLI	SDG: H3321								
Sample Number		J03WJ1		J03WJ2		J03WJ3		J03WJ4	
Remarks								E. Blank	
Sample Date		8/9/05		8/9/05		8/9/05		8/9/05	
Extraction Date		8/15/05		8/15/05		8/15/05		8/15/05	
Analysis Date		8/16/05		8/16/05		8/16/05		8/16/05	
Semivolatile (8270C)	RQL	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline*	660	830	U	830	U	830	U	830	U
Acenaphthene	660	330	U	330	U	330	U	330	U
2,4-Dinitrophenol*	660	830	U	830	U	830	U	830	U
4-Nitrophenol*	660	830	U	830	U	830	U	830	U
Dibenzofuran	660	330	U	330	U	330	U	330	U
2,4-Dinitrotoluene	660	330	U	330	U	330	U	330	U
Diethylphthalate	660	330	U	330	U	330	U	330	U
4-Chlorophenyl-phenyl ether	660	330	U	330	U	330	U	330	U
Fluorene	660	330	U	330	U	330	U	330	U
4-Nitroaniline*	660	830	U	830	U	830	U	830	U
4,6-Dinitro-2-methylphenol*	660	830	U	830	U	830	U	830	U
N-Nitrosodiphenylamine	660	330	U	330	U	330	U	330	U
4-Bromophenyl-phenyl ether	660	330	U	330	U	330	U	330	U
Hexachlorobenzene	660	330	U	330	U	330	U	330	U
Pentachlorophenol*	660	830	U	830	U	830	U	830	U
Phenanthrene	660	330	U	340		37		330	U
Anthracene	660	330	U	47		330	U	330	U
Carbazole	660	330	U	330	U	330	U	330	U
Di-n-butylphthalate	660	330	U	660	U	660	U	330	U
Fluoranthene	660	27		690		140		330	U
Pyrene	660	23		510		120		330	U
Butylbenzylphthalate	660	330	U	28		330	U	330	U
3,3'-Dichlorobenzidine	660	330	U	330	U	330	U	330	U
Benzo(a)anthracene	660	18		290		84		330	U
Chrysene	660	22		340		100		330	U
bis(2-Ethylhexyl)phthalate	660	660	U	660	U	660	U	660	U
Di-n-octylphthalate	660	330	U	330	U	330	U	330	U
Benzo(b)fluoranthene	660	330	U	220		660	U	330	U
Benzo(k)fluoranthene	660	660	U	180		660	U	330	U
Benzo(a)pyrene	660	330	U	180		63		330	U
Indeno(1,2,3-cd)pyrene	660	330	U	110		660	U	330	U
Dibenz(a,h)anthracene	660	330	U	61		25		330	U
Benzo(g,h,i)perylene	660	330	U	660	U	660	U	330	U

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results.

All other qualifiers shown were applied during validation.

* - RQL exceeded

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List — Report Date: 08/18/05 08:03

RFW Batch Number: 0508L141 — Client: TNU-HANFORD B04-002 — Work Order: 11343606001 — Page: 1a

	Cust ID:	J03WJ1	J03WJ1	J03WJ1	J03WJ2	J03WJ3	J03WJ4
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	74 %	67 %	74 %	66 %	71 %	83 %
	2-Fluorobiphenyl	80 %	76 %	86 %	76 %	81 %	89 %
	Terphenyl-d14	106 %	85 %	99 %	104 %	114 %	124 %
	Phenol-d5	77 %	69 %	77 %	73 %	80 %	93 %
	2-Fluorophenol	73 %	64 %	68 %	66 %	76 %	89 %
	2,4,6-Tribromophenol	93 %	89 %	107 %	102 %	106 %	104 %
Phenol		330 U	62 %	75 %	330 U	330 U	330 U
bis(2-Chloroethyl)ether		330 U	62 %	68 %	330 U	330 U	330 U
2-Chlorophenol		330 U	63 %	70 %	330 U	330 U	330 U
1,3-Dichlorobenzene		330 U	61 %	65 %	330 U	330 U	330 U
1,4-Dichlorobenzene		330 U	57 %	61 %	330 U	330 U	330 U
1,2-Dichlorobenzene		330 U	62 %	66 %	330 U	330 U	330 U
2-Methylphenol		330 U	68 %	77 %	330 U	330 U	330 U
2,2'-oxybis(1-Chloropropane)		330 U	61 %	67 %	330 U	330 U	330 U
4-Methylphenol		330 U	68 %	79 %	330 U	330 U	330 U
N-Nitroso-di-n-propylamine		330 U	66 %	74 %	330 U	330 U	330 U
Hexachloroethane		330 U	60 %	62 %	330 U	330 U	330 U
Nitrobenzene		330 U	64 %	72 %	330 U	330 U	330 U
Isophorone		330 U	75 %	88 %	330 U	330 U	330 U
2-Nitrophenol		330 U	68 %	79 %	330 U	330 U	330 U
2,4-Dimethylphenol		330 U	65 %	73 %	330 U	330 U	330 U
bis(2-Chloroethoxy)methane		330 U	67 %	78 %	330 U	330 U	330 U
2,4-Dichlorophenol		330 U	70 %	83 %	330 U	330 U	330 U
1,2,4-Trichlorobenzene		330 U	64 %	72 %	330 U	330 U	330 U
Naphthalene		330 U	65 %	74 %	330 U	330 U	330 U
4-Chloroaniline		330 U	80 %	90 %	330 U	330 U	330 U
Hexachlorobutadiene		330 U	70 %	75 %	330 U	330 U	330 U
4-Chloro-3-methylphenol		330 U	78 %	92 %	330 U	330 U	330 U
2-Methylnaphthalene		330 U	71 %	81 %	330 U	330 U	330 U
Hexachlorocyclopentadiene		330 U	51 %	52 %	330 U	330 U	330 U
2,4,6-Trichlorophenol		330 U	80 %	95 %	330 U	330 U	330 U
2,4,5-Trichlorophenol		830 U	84 %	97 %	830 U	830 U	830 U

*= Outside of EPA CLP QC limits.

9/8/05

0000013

RFW Batch Number: 0508L141 Client: TNU-HANFORD B04-002 Work Order: 11343606001 Page: 1b

Cust ID:	J03WJ1	J03WJ1	J03WJ1	J03WJ2	J03WJ3	J03WJ4
RFW#:	001	001 MS	001 MSD	002	003	004
2-Chloronaphthalene	330 U	75 %	87 %	330 U	330 U	330 U
2-Nitroaniline	830 U	79 %	94 %	830 U	830 U	830 U
Dimethylphthalate	330 U	81 %	95 %	330 U	330 U	330 U
Acenaphthylene	330 U	78 %	91 %	330 U	330 U	330 U
2,6-Dinitrotoluene	330 U	85 %	102 %	330 U	330 U	330 U
3-Nitroaniline	830 U	82 %	96 %	830 U	830 U	830 U
Acenaphthene	330 U	77 %	91 %	330 U	330 U	330 U
2,4-Dinitrophenol	830 U	73 %	79 %	830 U	830 U	830 U
4-Nitrophenol	830 U	79 %	95 %	830 U	830 U	830 U
Dibenzofuran	330 U	79 %	94 %	330 U	330 U	330 U
2,4-Dinitrotoluene	330 U	87 %	104 %	330 U	330 U	330 U
Diethylphthalate	330 U	81 %	96 %	330 U	330 U	330 U
4-Chlorophenyl-phenylether	330 U	77 %	92 %	330 U	330 U	330 U
Fluorene	330 U	80 %	94 %	330 U	330 U	330 U
4-Nitroaniline	830 U	66 %	75 %	830 U	830 U	830 U
4,6-Dinitro-2-methylphenol	830 U	85 %	105 %	830 U	830 U	830 U
N-Nitrosodiphenylamine (1)	330 U	63 %	77 %	330 U	330 U	330 U
4-Bromophenyl-phenylether	330 U	68 %	85 %	330 U	330 U	330 U
Hexachlorobenzene	330 U	80 %	100 %	330 U	330 U	330 U
Pentachlorophenol	830 U	87 %	113 %	830 U	830 U	830 U
Phenanthrene	330 U	80 %	98 %	340	37 J	330 U
Anthracene	330 U	79 %	98 %	47 J	330 U	330 U
Carbazole	330 U	70 %	83 %	330 U	330 U	330 U
Di-n-butylphthalate	330 U	80 %	99 %	660 ~~68~~ JB U	660 ~~56~~ JB U	380 B
Fluoranthene	27 J	84 %	104 %	690	140 J	330 U
Pyrene	23 J	78 %	95 %	510	120 J	330 U
Butylbenzylphthalate	330 U	83 %	102 %	28 J	330 U	330 U
3,3'-Dichlorobenzidine	330 U	82 %	96 %	330 U	330 U	330 U
Benzo(a)anthracene	18 J	78 %	96 %	290 J	84 J	330 U
Chrysene	22 J	76 %	94 %	340	100 J	330 U
bis(2-Ethylhexyl)phthalate	660 ~~65~~ JB U	79 %	100 %	660 ~~140~~ JB U	660 ~~130~~ JB U	660 ~~170~~ JB U
Di-n-octyl phthalate	330 U	77 %	100 %	330 U	330 U	330 U
Benzo(b)fluoranthene	330 U	71 %	90 %	220 ~~660 220~~ JB U	660 ~~80~~ JB U	330 U
Benzo(k)fluoranthene	660 ~~22~~ JB U	83 %	103 %	180 ~~660 180~~ JB U	660 ~~66~~ JB U	330 U
Benzo(a)pyrene	330 U	79 %	97 %	180 J	63 J	330 U
Indeno(1,2,3-cd)pyrene	330 U	89 %	101 %	110 ~~660 110~~ JB U	660 ~~44~~ JB U	330 U
Dibenz(a,h)anthracene	330 U	89 %	103 %	61 J	25 J	330 U
Benzo(g,h,i)perylene	330 U	85 %	96 %	660 ~~110~~ JB U	660 ~~47~~ JB U	330 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

9/8/05

0000014

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 08/18/05 08:03

RFW Batch Number: 0508L141 Client: TNU-HANFORD B04-002 Work Order: 11343606001 Page: 2a

		Cust ID:	SBLKNM	SBLKNM BS
Sample Information		RFW#:	05LE0679-MB1	05LE0679-MB1
		Matrix:	SOIL	SOIL
		D.F.:	1.00	1.00
		Units:	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5		60 %	85 %
	2-Fluorobiphenyl		65 %	87 %
	Terphenyl-d14		114 %	90 %
	Phenol-d5		65 %	81 %
	2-Fluorophenol		61 %	80 %
	2,4,6-Tribromophenol		80 %	100 %
Phenol			330 U	72 %
bis(2-Chloroethyl)ether			330 U	76 %
2-Chlorophenol			330 U	74 %
1,3-Dichlorobenzene			330 U	74 %
1,4-Dichlorobenzene			330 U	72 %
1,2-Dichlorobenzene			330 U	76 %
2-Methylphenol			330 U	73 %
2,2'-oxybis(1-Chloropropane)			330 U	74 %
4-Methylphenol			330 U	70 %
N-Nitroso-di-n-propylamine			330 U	73 %
Hexachloroethane			330 U	72 %
Nitrobenzene			330 U	79 %
Isophorone			330 U	82 %
2-Nitrophenol			330 U	80 %
2,4-Dimethylphenol			330 U	54 %
bis(2-Chloroethoxy)methane			330 U	77 %
2,4-Dichlorophenol			330 U	76 %
1,2,4-Trichlorobenzene			330 U	77 %
Naphthalene			330 U	78 %
4-Chloroaniline			330 U	88 %
Hexachlorobutadiene			330 U	86 %
4-Chloro-3-methylphenol			330 U	79 %
2-Methylnaphthalene			330 U	79 %
Hexachlorocyclopentadiene			330 U	33 %
2,4,6-Trichlorophenol			330 U	84 %
2,4,5-Trichlorophenol			830 U	85 %

*= Outside of EPA CLP QC limits.

0000015

K 9/8/05

Cust ID: SBLKNM SBLKNM BS

RFW#: 05LE0679-MB1 05LE0679-MB1

2-Chloronaphthalene	330	U	84	%
2-Nitroaniline	830	U	89	%
Dimethylphthalate	330	U	87	%
Acenaphthylene	330	U	84	%
2,6-Dinitrotoluene	330	U	92	%
3-Nitroaniline	830	U	91	%
Acenaphthene	330	U	84	%
2,4-Dinitrophenol	830	U	70	%
4-Nitrophenol	830	U	90	%
Dibenzofuran	330	U	86	%
2,4-Dinitrotoluene	330	U	94	%
Diethylphthalate	330	U	87	%
4-Chlorophenyl-phenylether	330	U	82	%
Fluorene	330	U	86	%
4-Nitroaniline	830	U	75	%
4,6-Dinitro-2-methylphenol	830	U	102	%
N-Nitrosodiphenylamine (1)	330	U	72	%
4-Bromophenyl-phenylether	330	U	77	%
Hexachlorobenzene	330	U	90	%
Pentachlorophenol	830	U	99	%
Phenanthrene	330	U	89	%
Anthracene	330	U	91	%
Carbazole	330	U	71	%
Di-n-butylphthalate	71	J	87	%
Fluoranthene	330	U	97	%
Pyrene	330	U	82	%
Butylbenzylphthalate	330	U	90	%
3,3'-Dichlorobenzidine	330	U	102	%
Benzo(a)anthracene	330	U	90	%
Chrysene	330	U	85	%
bis(2-Ethylhexyl)phthalate	140	J	85	%
Di-n-octyl phthalate	330	U	88	%
Benzo(b)fluoranthene	24	J	96	%
Benzo(k)fluoranthene	31	J	81	%
Benzo(a)pyrene	330	U	89	%
Indeno(1,2,3-cd)pyrene	17	J	101	%
Dibenz(a,h)anthracene	330	U	104	%
Benzo(g,h,i)perylene	27	J	99	%

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B04-002
LVL #: 0508L141
SDG/SAF # H332/ /B04-002

W.O. #: 11343-606-001-9999-00
Date Received: 08-12-2005

SEMIVOLATILE

Four (4) soil samples were collected on 08-09-2005.

The samples and their associated QC samples were extracted according to Lionville Laboratory SOPs based on SW 846 method 3540C on 08-15-2005 and analyzed according to criteria set forth in Lionville Laboratory SOPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 08-16-2005.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. All surrogate recoveries were within acceptance criteria.
5. All matrix spike recoveries were within acceptance criteria.
6. All blank spike recoveries were within acceptance criteria.
7. The method blank contained the common laboratory contaminants Di-n-butylphthalate and Bis (2-Ethylhexyl) phthalate at levels less than the CRQL. The method blank also contained the target compounds Benzo (b) fluoranthene, Benzo (k) fluoranthene, Benzo (a) pyrene, Indeno (1,2,3-cd) pyrene and Benzo (g, h, i) perylene at levels less than the CRQL.
8. Internal standard area and retention time criteria were met.
9. Manual integrations are performed according to SOP QA-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
11. I certify, that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data, contained in this hard-copy data package, has been authorized, by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/22/05
Date

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B04-002-044	Page 1 of 1
Collector D Bowersw/C Martinez/J Kiesler	Company Contact Doug Bowers	Telephone No. 531-0701	Project Coordinator KESSNER, JH	Price Code Many Data Turnaround
Project Designation 100 BC Burial Grounds - Soil Full Protocol	Sampling Location 600-233 @ 100 BC		SAF No. B04-002	Air Quality | | 14 day
Ice Chest No. ERC-99-062	Field Logbook No. EL 1173-5	COA R602332000	Method of Shipment Fed Ex	
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A050348		Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C							
Type of Container	aG	aG	aG	aG							
No. of Container(s)	1	1	1	1							
Volume	250mL	120mL	250mL	250mL							
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1							
Sample No. / Matrix * / Sample Date / Sample Time											
J03WJ1 / SOIL / 8-9-05 / 1040	X	X	X	X						E	
J03WJ2 / SOIL / / 1044	X	X	X	X						W	
J03WJ3 / SOIL / / 1052	X	X	X	X						W	
J03WJ4 / SOIL / ✓ / 1037	X		X							B	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	
D049 Doug Bowers 8-9-05/1530	Ref 2B 3728	8-9-05/1530	
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	
3728 Ref 2B 8/10/05 1300	[illegible]	8/10/05 800	
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	
[illegible] 8/10/05 800	FED EX		
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	
FED EX 8/10/05 0930	[illegible]	8/10/05 0930	
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	
Relinquished By/Removed From / Date/Time	Received By/Stored In	Date/Time	

SPECIAL INSTRUCTIONS (1) ICP Metals - 6010 (Client List) {~~Aluminum, Antimony~~, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquid
T=Tissue
WI=Wine
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

0000019

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 600-233			DATA PACKAGE: H3321		
VALIDATOR: JLI		LAB: LLI		DATE: 9/3/05	
			SDG: H3321		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J03WJ1 J03WJ2 J03WJ3 J03WJ4					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A

Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

Laboratory blank results acceptable? ..... Yes No N/A

Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: di-n-butyl phthalate – 2+3 Ucut RQL FB – none
benzo(b) fluoranthene – 2+3
benzo(K) fluoranthene – 1+2+3
Indeno(1,2,3-cd)pyrene – 2+3
benzo(g,h,i)perylene – 2+3
bis(2-ethylhexyl) phthalate – all

4. ACCURACY (Levels C, D, and E)

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A

Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A

Surrogates traceable? (Levels D, E) ..... Yes No N/A

Surrogates expired? (Levels D, E) ..... Yes No N/A

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

LCS/BSS results acceptable? ..... Yes No N/A

Standards traceable? (Levels D, E) ..... Yes No N/A

Standards expired? (Levels D, E) ..... Yes No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PAS

GC/MS ORGANIC DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD RPD values acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments:_____

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No (N/A)
Iinternal standard areas acceptable? ..... Yes No (N/A)
Internal standard retention times acceptable? ..... Yes No (N/A)
Standards traceable? ..... Yes No (N/A)
Standards expired? ..... Yes No (N/A)
Transcription/calculation errors? ..... Yes No (N/A)

Comments:_____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A

Comments:_____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E)	Yes	No	(N/A)
Compound quantitation acceptable? (Levels D, E)	Yes	No	(N/A)
Results reported for all requested analyses?	(Yes)	No	N/A
Results supported in the raw data? (Levels D, E)	Yes	No	(N/A)
Samples properly prepared? (Levels D, E)	Yes	No	(N/A)
Laboratory properly identified and coded all TIC? (Levels D, E)	Yes	No	(N/A)
Detection limits meet RDL?	Yes	(No)	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	(N/A)

Comments: 32 over

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed?	Yes	No	(N/A)
GPC check performed?	Yes	No	(N/A)
GPC check recoveries acceptable?	Yes	No	(N/A)
GPC calibration performed?	Yes	No	(N/A)
GPC calibration check performed?	Yes	No	(N/A)
GPC calibration check retention times acceptable?	Yes	No	(N/A)
Check/calibration materials traceable?	Yes	No	(N/A)
Check/calibration materials Expired?	Yes	No	(N/A)
Analytical batch QC given similar cleanup?	Yes	No	(N/A)
Transcription/Calculation Errors?	Yes	No	(N/A)

Comments:

Environmental Surveillance/Self Assessment Schedule
FY 2006

Surveillance - Review completeness of the 300 Area Air, Water, Waste, and Tank records.
Completion date - 10/31/05. Lead - Ray Collins

Self-Assessment - Review compliance with procedures for sample shipping/transportation.
Completion date - 12/31/05. Lead - Roger Ovink

Surveillance - Review operations and records for the 100N Area Sewage Lagoon.
Completion date - 1/31/06. Lead - Ray Collins

Surveillance - Review compliance with Treatment, Storage, and Disposal requirements.
Completion date - 2/28/06. Lead - Roger Landon

Surveillance - Review adequacy of site closure documentation for Field Remediation Projects.
Completion date - 3/31/06. Lead - Darci Teel

Surveillance - Review effectiveness of implementing Institutional Controls.
Completion date 4/30/06. Lead - Roger Landon

Surveillance - Review compliance with regulatory decision and primary documents.
Completion date - 6/30/06. Lead - Ray Collins

Surveillance - Review implementation of the Air Operating Permit requirements (stacks).
Completion date - 7/31/06. Lead - Ray Collins

Laboratory Audit - Laboratory location and audit date to be determined.
Lead – QA with Environmental support (Roger Ovink)

Date: 9 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Ground – Soil Full Protocol – 600-233
Subject: Wet Chemistry - Data Package No. H3321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3321-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Basis
J03WJ1	8/9/05	Soil	C	See note 1
J03WJ2	8/9/05	Soil	C	See note 1
J03WJ3	8/9/05	Soil	C	See note 1

1 – Total Petroleum Hydrocarbons (TPH) by 418.1.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 14 days for TPH.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J".

Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity

(concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3321-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3321	REVIEWER: TLI	Project: 600-233	PAGE 1 OF 1
Comments: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD							
Laboratory: LLI	SDG: H3321						
Sample Number		J03WJ1		J03WJ2		J03WJ3	
Remarks							
Sample Date		8/9/05		8/9/05		8/9/05	
Wet Chemistry	RQL	Result	Q	Result	Q	Result	Q
Total Petroleum Hydrocarbons	5	133	U	132	U	132	U

600009

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/25/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WJ1	% Solids	99.9		%	0.01	1.0
		Petroleum Hydrocarbons	133	u	MG/KG	133	1.0
-002	J03WJ2	% Solids	100		%	0.01	1.0
		Petroleum Hydrocarbons	132	u	MG/KG	132	1.0
-003	J03WJ3	% Solids	99.9		%	0.01	1.0
		Petroleum Hydrocarbons	132	u	MG/KG	132	1.0
-004	J03WJ4	% Solids	99.9		%	0.01	1.0

9/8/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B04-002 H3321
LVL#: 0508L141

W.O.#: 11343-606-001-9999-00
Date Received: 08-12-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

   LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Petroleum Hydrocarbons (PHC) was within the method criteria.

6. The Laboratory Control Sample (LCS) for PHC was within the laboratory control limits.

7. The matrix spike recovery for PHC was within the 75-125% control limits.

8. The replicate analysis for PHC was within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

May 24, 2006
Date

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

njp\08-141

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B04-002-044	Page 1 of 1
Collector D Bowersw/C Martinez/J Kiesler	Company Contact Doug Bowers	Telephone No. 531-0701	Project Coordinator KESSNER, JH	Price Code Many Air Quality 1	Data Turnaround 07 14 day
Project Designation 100 BC Burial Grounds - Soil Full Protocol	Sampling Location 600-233 @ 100 BC		SAF No. B04-002		
Ice Chest No. ERC-99-062	Field Logbook No. EL 1173-5	COA R602332000	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES LIONVILLE	Offsite Property No. A050348		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C						
Type of Container	aG	aG	aG	aG						
No. of Container(s)	1	1	1	1						
Volume	250mL	120mL	250mL	250mL						

SAMPLE ANALYSIS

	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1						
Sample No.	Matrix *	Sample Date	Sample Time							
J03WJ1	SOIL	8-9-05	1040	X	X	X	X			E
J03WJ2	SOIL		1048	X	X	X	X			W
J03WJ3	SOIL		1052	X	X	X	X			W
J03WJ4	SOIL	↓	1037	X		X				B

0000013

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From / Date/Time	Received By/Stored In / Date/Time	
Doug Bowers Bowers 8-9-05/1530	Ref 2B 3728 8-9-05/1530	
3728 Ref 2B 8/10/05 1300	Eberline Doug Bowers 8/10/05 1300	
RA Sec Officer 8/10/05 1300	FED EX	
FED EX 8/10/05 0930	8/10/05 0930	

SPECIAL INSTRUCTIONS 8-9-05

(1) ICP Metals - 6010 (Client List) ~~Aluminum~~, ~~Antimony~~, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
Wi=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 600-233			DATA PACKAGE: H3321		
VALIDATOR: JCI		LAB: LLI		DATE: 9/3/05	
			SDG: H3321		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J03WJ1 J03WJ2 J03WJ3					
				Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: no FB

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A

Comments: no PA

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments: _____

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... (Yes) No N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: all ok

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/25/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LHC052-MB1	Petroleum Hydrocarbons	133	u	MG/KG	133	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/25/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J03WJ1	Petroleum Hydrocarbons	522	34.0	559	87.2	1.0
BLANK10	05LHC052-MB1	Petroleum Hydrocarbons	525	133 u	560	93.8	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/25/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J03WJ1	Petroleum Hydrocarbons	133 u	133 u	NC	1.0

Date: 9 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Grounds – Soil Full Protocol – Waste Site 600-233
Subject: PCB - Data Package No. H3321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3321-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Matrix	Validation	Date
J03WJ1	8/9/05	Soil	C	See note 1
J03WJ2	8/9/05	Soil	C	See note 1
J03WJ3	8/9/05	Soil	C	See note 1
J03WJ4	8/9/05	Soil	C	See note 1

1 - PCBs by 8082.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all

associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required quantitation limit (RQL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RQL, the result is qualified as undetected and elevated to the RQL.

All method blank results were acceptable.

Field Blanks

One field blank (J03WJ4) was submitted for analysis. No analytes were detected in the field blank.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All accuracy results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All precision results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data Package No. H3321-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

PCB DATA QUALIFICATION SUMMARY*

SDG: H3321	REVIEWER: TLI	Project: 600-233	PAGE 1 OF 1
Comments: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG) Page__1__ of__1__

Project: BECHTEL-HANFORD									
Laboratory: LLI	SDG: H3321								
Sample Number		J03WJ1		J03WJ2		J03WJ3		J03WJ4	
Remarks								E. Blank	
Sample Date		8/9/05		8/9/05		8/9/05		8/9/05	
Extraction Date		8/15/05		8/15/05		8/15/05		8/15/05	
Analysis Date		8/17/05		8/17/05		8/17/05		8/17/05	
PCB/Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	13	U	13	U	13	U
Aroclor-1221	20	13	U	13	U	13	U	13	U
Aroclor-1232	20	13	U	13	U	13	U	13	U
Aroclor-1242	20	13	U	13	U	13	U	13	U
Aroclor-1248	20	13	U	13	U	13	U	13	U
Aroclor-1254	20	13	U	13	U	13	U	13	U
Aroclor-1260	20	13	U	13	U	13	U	13	U

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 08/18/05 09:21

RFW Batch Number: **0508L141** Client: **TNU-HANFORD B04-002** Work Order: 11343606001 Page: 1

	Cust ID:	J03WJ1	J03WJ1	J03WJ1	J03WJ2	J03WJ3	PBLKRS
Sample Information	RFW#:	001	001 MS	001 MSD	002	003	05LE0682-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		102 %	110 %	109 %	103 %	105 %	95 %
Decachlorobiphenyl		114 %	114 %	115 %	119 %	113 %	100 %
Aroclor-1016		13 U	108 %	102 %	13 U	13 U	13 U
Aroclor-1221		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1232		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1242		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1248		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1254		13 U	13 U	13 U	13 U	13 U	13 U
Aroclor-1260		13 U	116 %	106 %	13 U	13 U	13 U

	Cust ID:	PBLKRS BS
Sample Information	RFW#:	05LE0682-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	UG/KG
Surrogate: Tetrachloro-m-xylene		94 %
Decachlorobiphenyl		103 %
Aroclor-1016		93 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		105 %

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

JR 9/8/05

000011

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Case Narrative

Client: TNU-HANFORD B04-002
LVL #: 0508L141
SDG/SAF # H332\ /B04-002

W.O. #: 11343-606-001-9999-00
Date Received: 08-12-2005

PCB

Three (3) soil samples were collected on 08-09-2005.

The samples and their associated QC samples were extracted on 08-15-2005 and analyzed according to Lionville Laboratory SOPs based on SW846, 3rd Edition procedures on 08-17-2005. The extraction procedure was based on method 3540C and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received Copper-Sulfur and Sulfuric Acid cleanups according to Lionville Laboratory SOPs based on SW846 methods 3660A and 3665A respectively.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recoveries were within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. The initial calibrations associated with this data set were within acceptance criteria.
9. The continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.
11. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/24/05
Date

kim\r:\group\data\pest\tnu hanford\0508-141.pcb

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B04-002-044	Page 1 of 1
Collector D Bowersw/C Martinez/J Kiesler	Company Contact Doug Bowers	Telephone No. 531-0701	Project Coordinator KESSNER, JH	Price Code Many Air Quality 1	Data Turnaround 14 day
Project Designation 100 BC Burial Grounds - Soil Full Protocol	Sampling Location 600-233 @ 100 BC		SAF No. B04-002		
Ice Chest No. ERC-99-062	Field Logbook No. EL 1173-5	COA R602332000	Method of Shipment Fed Ex		
Shipped To EBERLINE SERVICES (LIONVILLE)	Offsite Property No. A050348		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS

Non Rad

Special Handling and/or Storage

Cool 4°C

Preservation	None	Cool 4C	Cool 4C	Cool 4C
Type of Container	aG	aG	aG	aG
No. of Container(s)	1	1	1	1
Volume	250mL	120mL	250mL	250mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1

Sample No.	Matrix *	Sample Date	Sample Time									
J03WJ1	SOIL	8-9-05	1040	X	X	X	X					E
J03WJ2	SOIL		1049	X	X	X	X					W
J03WJ3	SOIL		1052	X	X	X	X					W
J03WJ4	SOIL	V	1037	X		X						B

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From Doug Bowers	Date/Time 8-9-05/1530	Received By/Stored In Ref 2B 3728	Date/Time 8-9-05/1530
Relinquished By/Removed From 3728 Ref 2B	Date/Time 8/10/05 1300	Received By/Stored In FEDEX	Date/Time 8/10/05 1300
Relinquished By/Removed From FEDEX	Date/Time 8/10/05 1300	Received By/Stored In FEDEX	Date/Time
Relinquished By/Removed From FEDEX	Date/Time 8/10/05 0930	Received By/Stored In	Date/Time 8/10/05 0930
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS D B 8-9-05

(1) ICP Metals - 6010 (Client List) ~~(Aluminum, Antimony~~, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, Vanadium, Zinc}; Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SI=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

0000014

Appendix 5

Data Validation Supporting Documentation

PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 600-233			DATA PACKAGE: H3321		
VALIDATOR: TLT		LAB: LLT		DATE: 9/3/05	
			SDG: H3321		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J03WJ1 J03WJ2 J03WJ3 J03WJ4					
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations acceptable? ..... Yes No N/A

Continuing calibrations acceptable? ..... Yes No N/A

Standards traceable? ..... Yes No N/A

Standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments: _____

PCB DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments: _____

4. ACCURACY (Levels C, D, and E)

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD results acceptable? ..... Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A
MS/MSD standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: _____ see p45

PCB DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... (Yes) No N/A
Duplicate results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
Field duplicate RPD values acceptable? ..... Yes No (N/A)
Field split RPD values acceptable? ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No (N/A)
Positive results resolved acceptably? ..... Yes No (N/A)
Comments: _____

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... (Yes) No N/A
Sample holding times acceptable? ..... (Yes) No N/A
Comments: _____

PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No (N/A)
Compound quantitation acceptable? (Levels D, E) ..... Yes No (N/A)
Results reported for all requested analyses? ..... (Yes) No N/A
Results supported in the raw data? (Levels D, E) ..... Yes No (N/A)
Samples properly prepared? (Levels D, E) ..... Yes No (N/A)
Detection limits meet RDL? ..... (Yes) No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other absorbent) cleanup performed? ..... Yes No (N/A)
Lot check performed? ..... Yes No (N/A)
Check recoveries acceptable? ..... Yes No (N/A)
GPC cleanup performed? ..... Yes No (N/A)
GPC check performed? ..... Yes No (N/A)
GPC check recoveries acceptable? ..... Yes No (N/A)
GPC calibration performed? ..... Yes No (N/A)
GPC calibration check performed? ..... Yes No (N/A)
GPC calibration check retention times acceptable? ..... Yes No (N/A)
Check/calibration materials traceable? ..... Yes No (N/A)
Check/calibration materials Expired? ..... Yes No (N/A)
Analytical batch QC given similar cleanup? ..... Yes No (N/A)
Transcription/Calculation Errors? ..... Yes No (N/A)

Comments: _____

Date: 9 September 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100 BC Burial Grounds – Soil Full Protocol – Waste Site 600-233
Subject: Inorganics - Data Package No. H3321-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3321-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J03WJ1	8/9/05	Soil	C	See note 1
J03WJ2	8/9/05	Soil	C	See note 1
J03WJ3	8/9/05	Soil	C	See note 1
J03WJ4	8/9/05	Soil	C	See note 1

1 - ICP metals (6010B) and mercury (7471A).

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
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Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

- **Holding Times**

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

One field blank (J03WJ4) was submitted for analysis. Barium, chromium, copper, manganese, lead and zinc were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data . The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All silver results and the selenium result in samples J03WJ2, J03WJ3 and J03WJ4 exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H3321-LLI was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

All silver results and the selenium result in samples J03WJ2, J03WJ3 and J03WJ4 exceeded the RQL. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

METALS DATA QUALIFICATION SUMMARY*

SDG: H3321	REVIEWER: TLI	Project: 600-233	PAGE 1 OF 1
Comments: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD									
Laboratory: LL	SDG: H3321								
Sample Numbe		J03WJ1		J03WJ2		J03WJ3		J03WJ4	
Remarks								E. Blank	
Sample Date		8/9/05		8/9/05		8/9/05		8/9/05	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.50	U	0.50	U	0.49	U	0.50	U
Arsenic	10	2.5	U	2.5	U	2.5	U	2.5	U
Boron		1.5		1.3	U	1.3	U	1.3	U
Barium	2	50.2		51.2		46.5		5.4	
Beryllium		0.41		0.35		0.27		0.06	U
Cadmium	0.2	0.28		0.23		0.25		0.17	U
Cobalt		6.3		5.3		4.9		0.50	U
Chromium	1	7.7		7.9		6.1		0.77	
Copper		11.5		10.3		9.8		1.4	
Mercury	0.2	0.02	U	0.01	U	0.02	U	0.01	U
Manganese		270		249		223		17.5	
Molybdenum		0.88	U	0.89	U	0.87	U	0.89	U
Nickel		8.3		7.7		7.4		1.2	U
Lead	5	4.6		4.3		4.9		1.7	
Selenium	1	3.0		2.7	U	2.7	U	2.7	U
Vanadium		37.0		34.5		25.3		0.33	U
Zinc	1	33.8		30.7		28.5		3.2	

000010

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize miss-interpretation of results. All other qualifiers shown were applied during validation.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/23/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03WJ1	Silver, Total	0.50 u	MG/KG	0.50	6.0
		Arsenic, Total	2.5 u	MG/KG	2.5	6.0
		Boron, Total	1.5	MG/KG	1.3	6.0
		Barium, Total	50.2	MG/KG	0.11	6.0
		Beryllium, Total	0.41	MG/KG	0.06	6.0
		Cadmium, Total	0.28	MG/KG	0.17	6.0
		Cobalt, Total	6.3	MG/KG	0.50	6.0
		Chromium, Total	7.7	MG/KG	0.39	6.0
		Copper, Total	11.5	MG/KG	0.44	6.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	270	MG/KG	0.11	6.0
		Molybdenum, Total	0.88 u	MG/KG	0.88	6.0
		Nickel, Total	8.3	MG/KG	1.2	6.0
		Lead, Total	4.6	MG/KG	1.4	6.0
		Selenium, Total	3.0	MG/KG	2.7	6.0
		Vanadium, Total	37.0	MG/KG	0.33	6.0
		Zinc, Total	33.8	MG/KG	0.28	6.0
-002	J03WJ2	Silver, Total	0.50 u	MG/KG	0.50	6.0
		Arsenic, Total	2.5 u	MG/KG	2.5	6.0
		Boron, Total	1.3 u	MG/KG	1.3	6.0
		Barium, Total	51.2	MG/KG	0.11	6.0
		Beryllium, Total	0.35	MG/KG	0.06	6.0
		Cadmium, Total	0.23	MG/KG	0.17	6.0
		Cobalt, Total	5.3	MG/KG	0.50	6.0
		Chromium, Total	7.9	MG/KG	0.39	6.0
		Copper, Total	10.3	MG/KG	0.44	6.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	249	MG/KG	0.11	6.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	6.0
		Nickel, Total	7.7	MG/KG	1.2	6.0
		Lead, Total	4.3	MG/KG	1.4	6.0
		Selenium, Total	2.7 u	MG/KG	2.7	6.0
		Vanadium, Total	34.5	MG/KG	0.33	6.0
		Zinc, Total	30.7	MG/KG	0.28	6.0

9/8/05

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 08/23/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J03WJ3	Silver, Total	0.49 u	MG/KG	0.49	6.0
		Arsenic, Total	2.5 u	MG/KG	2.5	6.0
		Boron, Total	1.3 u	MG/KG	1.3	6.0
		Barium, Total	46.5	MG/KG	0.11	6.0
		Beryllium, Total	0.27	MG/KG	0.05	6.0
		Cadmium, Total	0.25	MG/KG	0.16	6.0
		Cobalt, Total	4.9	MG/KG	0.49	6.0
		Chromium, Total	6.1	MG/KG	0.38	6.0
		Copper, Total	9.8	MG/KG	0.44	6.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Manganese, Total	223	MG/KG	0.11	6.0
		Molybdenum, Total	0.87 u	MG/KG	0.87	6.0
		Nickel, Total	7.4	MG/KG	1.2	6.0
		Lead, Total	4.9	MG/KG	1.4	6.0
		Selenium, Total	2.7 u	MG/KG	2.7	6.0
		Vanadium, Total	25.3	MG/KG	0.33	6.0
		Zinc, Total	28.5	MG/KG	0.27	6.0
-004	J03WJ4	Silver, Total	0.50 u	MG/KG	0.50	6.0
		Arsenic, Total	2.5 u	MG/KG	2.5	6.0
		Boron, Total	1.3 u	MG/KG	1.3	6.0
		Barium, Total	5.4	MG/KG	0.11	6.0
		Beryllium, Total	0.06 u	MG/KG	0.06	6.0
		Cadmium, Total	0.17 u	MG/KG	0.17	6.0
		Cobalt, Total	0.50 u	MG/KG	0.50	6.0
		Chromium, Total	0.77	MG/KG	0.39	6.0
		Copper, Total	1.4	MG/KG	0.44	6.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Manganese, Total	17.5	MG/KG	0.11	6.0
		Molybdenum, Total	0.89 u	MG/KG	0.89	6.0
		Nickel, Total	1.2 u	MG/KG	1.2	6.0
		Lead, Total	1.7	MG/KG	1.4	6.0
		Selenium, Total	2.7 u	MG/KG	2.7	6.0
		Vanadium, Total	0.33 u	MG/KG	0.33	6.0
		Zinc, Total	3.2	MG/KG	0.28	6.0

9/8/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B04-002
LVL#: 0508L141
SDG/SAF#: H3311/B04-002

W.O.#: 11343-606-001-9999-00
Date Received: 08-12-05

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. The samples were analyzed with 6-fold dilutions for ICP metals due sample matrix.

3. All analyses were performed within the required holding times.

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 3 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

8/24/08
Date

jjw/m08-141

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B04-002-044 | Page 1 of 1

Collector: D Bowersw/C Martinez/J Kiesler	Company Contact: Doug Bowers	Telephone No.: 531-0701	Project Coordinator: KESSNER, JH
Project Designation: 100 BC Burial Grounds - Soil Full Protocol	Sampling Location: 600-233 @ 100 BC		SAF No.: B04-002
Ice Chest No.: ERC-99-062	Field Logbook No.: EL 1173-5	COA: R602332000	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES (LIONVILLE)	Offsite Property No.: A050348		Bill of Lading/Air Bill No.: SEE OSPC

Price Code: Many | Data Turnaround: Air Quality | | 14 day

POSSIBLE SAMPLE HAZARDS/REMARKS: Non Rad

Special Handling and/or Storage: Cool 4°C

0000016

SAMPLE ANALYSIS				See item (1) in Special Instructions.	PCBs - 8082	Semi-VOA - 8270A (TCL)	TPH (Total) - 418.1						
Preservation				None	Cool 4C	Cool 4C	Cool 4C						
Type of Container				aG	aG	aG	aG						
No. of Container(s)				1	1	1	1						
Volume				250mL	120mL	250mL	250mL						
Sample No.	Matrix *	Sample Date	Sample Time										
J03WJ1	SOIL	8-9-05	1040	X	X	X	X					E	
J03WJ2	SOIL		1048	X	X	X	X					W	
J03WJ3	SOIL		1052	X	X	X	X					W	
J03WJ4	SOIL	↓	1037	X		X						B	

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers	8-9-05/1530	Roll 2B 3728	8-9-05/1530
3728 Roll 2B	8/10/05 1300	[illegible]	8/10/05 800
[illegible]	8/10/05 800	FED EX	
[illegible]	8/10/05 0930	[illegible]	8/10/05 0930

SPECIAL INSTRUCTIONS

8-9-05

(1) ICP Metals - 6010 (Client List) (~~Aluminum~~, ~~Antimony~~, Arsenic, Barium, Beryllium, Boron, Cadmium, ~~Calcium~~, Chromium, Cobalt, Copper, ~~Iron~~, Lead, ~~Magnesium~~, Manganese, Molybdenum, Nickel, ~~Potassium~~, Selenium, ~~Silicon~~, Silver, ~~Sodium~~, Vanadium, Zinc); Mercury - 7470 - (CV)

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100BC 600-233			DATA PACKAGE: H3321		
VALIDATOR: TLP		LAB: LLI		DATE: 9/9/05	
			SDG: H3321		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J03WJ1	J03WJ2	J03WJ3	J03WJ4		
					Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? ..... Yes (No) N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No (N/A)

Initial calibrations acceptable? ..... Yes No (N/A)

ICP interference checks acceptable? ..... Yes No (N/A)

ICV and CCV checks performed on all instruments? ..... Yes No (N/A)

ICV and CCV checks acceptable? ..... Yes No (N/A)

Standards traceable? ..... Yes No (N/A)

Standards expired? ..... Yes No (N/A)

Calculation check acceptable? ..... Yes No (N/A)

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No (N/A)
ICB and CCB results acceptable? (Levels D, E) ..... Yes No (N/A)
Laboratory blanks analyzed? ..... (Yes) No N/A
Laboratory blank results acceptable? ..... (Yes) No N/A
Field blanks analyzed? (Levels C, D, E) ..... (Yes) No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes (No) N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Comments: Contamination

FB – Barium chromium copper manganese lead zinc

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... (Yes) No N/A
MS/MSD results acceptable? ..... (Yes) No N/A
MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No (N/A)
MS/MSD standards expired? (Levels D, E) ..... Yes No (N/A)
LCS/BSS samples analyzed? ..... (Yes) No N/A
LCS/BSS results acceptable? ..... (Yes) No N/A
Standards traceable? (Levels D, E) ..... Yes No (N/A)
Standards expired? (Levels D, E) ..... Yes No (N/A)
Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)
Performance audit sample(s) analyzed? ..... Yes (No) N/A
Performance audit sample results acceptable? ..... Yes No (N/A)
Comments: NO PAS

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable?	Yes	No	N/A
Duplicate results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments:_____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed?	Yes	No	N/A
ICP serial dilution %D values acceptable?	Yes	No	N/A
ICP post digestion spike required?	Yes	No	N/A
ICP post digestion spike values acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments:_____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A
Duplicate injection %RSD values acceptable? ..... Yes No N/A
Analytical spikes performed as required? ..... Yes No N/A
Analytical spike recoveries acceptable? ..... Yes No N/A
Standards traceable? ..... Yes No N/A
Standards expired? ..... Yes No N/A
MSA performed as required? ..... Yes No N/A
MSA results acceptable? ..... Yes No N/A
Transcription/calculation errors? ..... Yes No N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... (Yes) No N/A

Rresults supported in the raw data? (Levels D, E) ..... Yes No (N/A)

Samples properly prepared? (Levels D, E) ..... Yes No (N/A)

Detection limits meet RDL? ..... Yes (No) N/A

Transcription/calculation errors? (Levels D, E) ..... Yes No (N/A)

Comments:

all silver over

3 selenium over

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 08/23/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	05L0471-MB1	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	0.45 u	MG/KG	0.45	1.0
		Boron, Total	0.23 u	MG/KG	0.23	1.0
		Barium, Total	0.13	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03	MG/KG	0.03	1.0
		Cobalt, Total	0.09 u	MG/KG	0.09	1.0
		Chromium, Total	0.11	MG/KG	0.07	1.0
		Copper, Total	0.12	MG/KG	0.08	1.0
		Manganese, Total	0.02	MG/KG	0.02	1.0
		Molybdenum, Total	0.16 u	MG/KG	0.16	1.0
		Nickel, Total	0.22 u	MG/KG	0.22	1.0
		Lead, Total	0.34	MG/KG	0.25	1.0
		Selenium, Total	0.53	MG/KG	0.49	1.0
		Vanadium, Total	0.06 u	MG/KG	0.06	1.0
		Zinc, Total	0.05 u	MG/KG	0.05	1.0
BLANK1	05C0210-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 08/23/05

CLIENT: TNUHANFORD B04-002 H3321

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L141

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	J03WJ1	Silver, Total	4.4	0.50u	4.6	95.7	6.0
		Arsenic, Total	184	2.5 u	185	99.2	6.0
		Boron, Total	82.5	1.5	92.7	87.4	6.0
		Barium, Total	226	50.2	185	94.8	6.0
		Beryllium, Total	4.9	0.41	4.6	97.7	6.0
		Cadmium, Total	4.8	0.28	4.6	98.4	6.0
		Cobalt, Total	50.6	6.3	46.4	95.5	6.0
		Chromium, Total	26.0	7.7	18.5	98.9	6.0
		Copper, Total	32.1	11.5	23.2	88.8	6.0
		Mercury, Total	0.14	0.02u	0.14	107.4	1.0
		Manganese, Total	304	270	46.4	74.6*	6.0
		Molybdenum, Total	88.3	0.88u	92.7	95.3	6.0
		Nickel, Total	54.8	8.3	46.4	100.2	6.0
		Lead, Total	50.2	4.6	46.4	98.3	6.0
		Selenium, Total	180	3.0	185	95.5	6.0
		Vanadium, Total	79.7	37.0	46.4	92.0	6.0
		Zinc, Total	75.4	33.8	46.4	89.7	6.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 08/23/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J03WJ1	Silver, Total	0.50u	0.49u	NC	6.0
		Arsenic, Total	2.5 u	3.0	NC 200	6.0
		Boron, Total	1.5	1.3 u	NC 200 MW 8/23/05	6.0
		Barium, Total	50.2	47.9	4.7	6.0
		Beryllium, Total	0.41	0.39	3.6	6.0
		Cadmium, Total	0.28	0.23	15.9	6.0
		Cobalt, Total	6.3	5.4	15.4	6.0
		Chromium, Total	7.7	6.4	18.4	6.0
		Copper, Total	11.5	11.2	2.6	6.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Manganese, Total	270	250	7.5	6.0
		Molybdenum, Total	0.88u	0.87u	NC	6.0
		Nickel, Total	8.3	8.1	2.4	6.0
		Lead, Total	4.6	4.6	0.00	6.0
		Selenium, Total	3.0	2.7 u	NC 200 MW 8/23/05	6.0
		Vanadium, Total	37.0	34.7	6.4	6.0
		Zinc, Total	33.8	29.8	12.6	6.0

Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 08/23/05

CLIENT: TNUHANFORD B04-002 H3321 LVL LOT #: 0508L141

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
LCS1	05L0471-LC1	Silver, LCS	50.4	50.0	MG/KG	100.8
		Arsenic, LCS	966	1000	MG/KG	96.6
		Boron, LCS	479	500	MG/KG	95.8
		Barium, LCS	504	500	MG/KG	100.8
		Beryllium, LCS	25.4	25.0	MG/KG	101.6
		Cadmium, LCS	25.1	25.0	MG/KG	100.4
		Cobalt, LCS	256	250	MG/KG	102.6
		Chromium, LCS	51.7	50.0	MG/KG	103.4
		Copper, LCS	127	125	MG/KG	101.7
		Manganese, LCS	77.2	75.0	MG/KG	102.9
		Molybdenum, LCS	512	500	MG/KG	102.4
		Nickel, LCS	201	200	MG/KG	100.6
		Lead, LCS	250	250	MG/KG	100
		Selenium, LCS	937	1000	MG/KG	93.7
		Vanadium, LCS	257	250	MG/KG	102.8
		Zinc, LCS	100	100	MG/KG	100
LCS1	05C0210-LC1	Mercury, LCS	6.7	6.2	MG/KG	107.5